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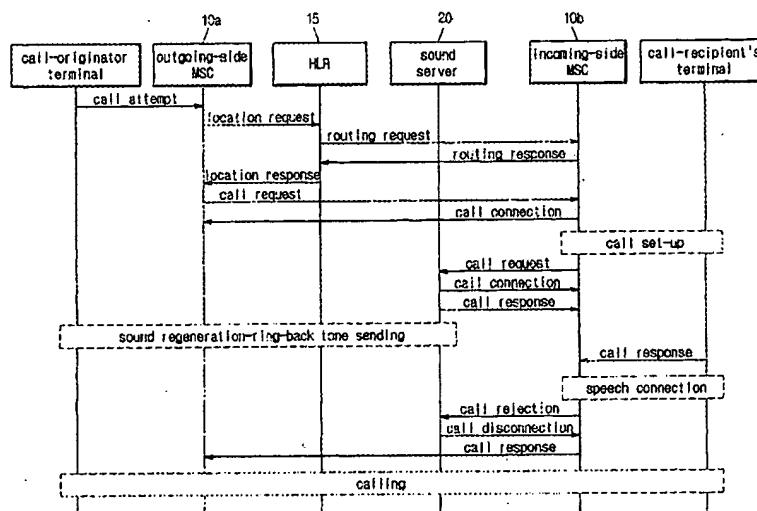
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(54) Title: RING-BACK TONE SERVICE SYSTEM AND THE METHOD



(57) Abstract: The present invention relates to a ring-back tone service system and the method for providing caller's terminal with various ring-back tones designated by each subscriber. The ring-back tone service system comprises: incoming/outgoing mobile switching centers MSC (10a, 10b) for performing call setup functions for ring-back tone sending request and for sending the ring-back tone, and for sending the ring-back tone to caller's terminal; a sound server (20) for storing and managing various ring-back tones and performing functions of sending ring-back tones according to request from the incoming MSC (10b); and a home location register HLR (15) for managing whether to have subscribed to the ring-back tone service, active/inactive status information and routing information to the sound servers (20). Thus, it is made possible for caller to receive various ring-back tones and determine whether the call is wrongly connected before recipient's answering.

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RING-BACK TONE SERVICE SYSTEM AND THE METHOD

Technical Field

The present invention relates to a ring-back tone
5 service for a communication terminal, and more particularly
to a system and method for providing a ring-back tone
service allowed to provide various ring-back tones to a
call-originator terminal, in which the various ring-back
tones are designated by subscribers in a communication
10 network.

Background of Art

In general, reviewing call-processing procedure for
calling between communication terminals, such as mobile
15 phones, PDAs, IMT-2000 terminals and so forth, a variety of
electrical signals are formed between the communication
terminal and a mobile switching center, between mobile
switching centers, and thereby the mobile switching center
performs choice, connection and disconnection of lines.

20 In other words, when a call-originator dials a
telephone number of a call-recipient after confirming a
dial tone with his/her own communication terminal in order
to speak with the call-recipient, a call signal is
generated to the corresponding call-recipient's terminal.
25 In response to this, a ring-back tone is provided to a
call-originator terminal. Here, when the call-recipient
hears a call sound and responds to the call, a speech
between the call-recipient and the call-originator is made.
After the calling is finished, connection between them is
30 released.

In the call-processing procedure by this sequence,
when the call-originator dials the telephone number of the
desired call-recipient to speak with the call-recipient,

the call signal is sent to the communication terminal of the call-recipient, and to inform the call-originator that the call signal is now sent to the recipient's terminal, a signal is sent from a mobile switching center to the
5 corresponding call-originator terminal. This signal spends about 3 to 10 seconds to do so, which is referred to as the "ring-back tone".

In this case, the foregoing ring-back tone is provided to the call-originator in a way that an undifferentiated
10 similar tone is periodically sent to the call-originator terminal. Therefore, the call-originator feels monotonous due to the similar ring-back tone hearing until the call-recipient responds to the call. Further, because the ring-back tone is the undifferentiated similar tone, the call-
15 originator fails to determine whether or not connected correctly until the call-recipient makes a response. Moreover, a service for various ring-back tones suitable for characteristics of each subscriber is not provided.

20 **Disclosure of the Invention**

Accordingly, the present invention has been made to solve the above-mentioned problems occurring in the prior art, and an object of the present invention is adapted to provide various ring-back tones such as melodies,
25 advertisements, effect sounds, words of greeting and so on which are registered by subscribers instead of an existing undifferentiated ring-back tone, with regard to a ring-back tone provided to a communication terminal.

It is another object of the present invention that by
30 providing various ring-back tones registered by subscribers to a communication terminal, a call-originator can determine whether or not connected correctly before a call-recipient makes a response, and at the same time various ring-back tones suitable for characteristics of the call-

recipients can be provided.

In order to accomplish this object, there is provided a system for providing a ring-back tone service to a call-originator terminal in a communication network, the system comprising: incoming/outgoing-side mobile switching centers (MSCs) for performing a call set-up function for a sending request of a ring-back tone and for sending the ring-back tone, receiving the corresponding ring-back tone, and sending the received ring-back tone to the call-originator terminal side; a sound server for storing and managing information on various ring-back tones designated by subscribers of the ring-back tone service, and performing a function for sending a designated ring-back tone corresponding to the sending request of the incoming-side MSC; and a home location register (HLR) for setting and managing two kinds of information to profile information, one of the two kinds of information being information on whether or not subscribed to the ring-back tone service and on an active/inactive state of the ring-back tone service, the other being information on routing to the sound server.

Here, it is characterized in that the sound server comprises: a subscriber database interworking process unit for storing and managing ring-back tone identification information on the ring-back tone for sending to the call-originator terminal on a subscriber database together with subscriber information; a sound database interworking process unit for storing and managing ring-back tone information designated according to each subscriber on a sound database together with the ring-back tone identification information; a sound processing unit for extracting a designated ring-back tone managed by the sound database interworking process unit based on the subscriber information managed by the subscriber database interworking

process unit, regenerating the extracted ring-back tone into a sound, and transmitting the regenerated sound; a network interworking unit for sending the designated ring-back tone regenerated into the sound by the sound
5 processing unit to the outgoing-side MSC in cooperation with the outgoing/incoming MSCs; and a service processing unit for processing operation of the server related to a series of ring-back tone services for sending the ring-back tone designated to a call-recipient to the call-originator
10 side through the outgoing MSC 10a by controlling the sound processing unit and the network interworking unit.

It is also characterized in that the subscriber database stores a call-recipient telephone number, caller ID information corresponding to the call-recipient
15 telephone number, and the ring-back tone identification information designated to the subscriber information divided according to a call-originator group, a call-originator age group, gender, calling time, and that the ring-back tone information is the designated ring-back tone
20 information selected from melodies, advertisements, effect sounds, words of greeting, each of which has the ring-back tone identification information.

Further, it is characterized in that the sound server further comprises an external interworking process unit for
25 providing a cooperation function for interworking with external equipment, and storing and managing the ring-back tone information toward the subscriber database interworking process unit and the sound database interworking process unit.

30 Furthermore, it is characterized in that the external interworking process unit comprises: a web cooperator for providing a function for producing and managing the ring-back tone information through a contents provider on the

basis of Internet; a terminal cooperator for providing functions for managing the ring-back tone services and for storing and managing particular ring-back tone information through a terminal on the basis of Internet; and an ARS
5 (Automatic Response Service) cooperator, for providing functions for managing the ring-back tone services and for storing and managing particular ring-back tone information through an automatic response system.

In another feature of the present invention, there is
10 provided a method for providing a ring-back tone service to a call-originator terminal in a communication network, the method comprising the steps of: a) registering and managing information on a particular ring-back tone for sending to the call-originator terminal by subscribers of the ring-
15 back tone service to a sound server; b) checking whether or not the ring-back tone service is activated by searching subscriber information on a call-recipient at a home location register (HLR) when an outgoing call is generated from arbitrary call-originator; c) when the ring-back tone
20 service of the call-recipient is activated, requesting routing to an incoming-side mobile switching center (MSC) to generate a call between the corresponding outgoing-side and incoming-side MSCs; and d) sending the ring-back tone designated to the call-recipient to the call-originator
25 terminal side by performing a call set-up with the sound server at the incoming-side MSC.

Here, it is characterized in that the step a) stores and manages ring-back tone identification information designated to the subscriber information based on a call-
30 recipient telephone number on a subscriber database, and stores and manages information on various ring-back tones designated according to each subscriber on a sound database together with ring-back tone identification information.

It is also characterized in that the ring-back tone information is one corresponding to the call-recipient telephone number, caller ID information corresponding to the call-recipient telephone number, and the ring-back tone identification information designated to the subscriber information divided according to a call-originator group, a call-originator age group, gender, calling time, and that the ring-back tone information is the designated ring-back tone information selected from melodies, advertisements, effect sounds, words of greeting, each of which has the ring-back tone identification information.

Further, it is characterized in that the step c) comprises the sub-steps of: requesting routing to the incoming-side MSC at the HLR according to a location information request of the outgoing-side MSC to receive incoming information; transmitting the received incoming information to the outgoing-side MSC together with routing information on routing to the sound server; and transmitting a call request message including the incoming information and the routing information to the incoming-side MSC at the outgoing-side MSC to generate the call between the incoming-side and outgoing-side MSCs.

Furthermore, it is characterized in that the step d) comprises the sub-steps of: performing operation for a speech set-up with the recipient's terminal using incoming information receiving from the outgoing-side MSC at the incoming-side MSC; and sending the ring-back tone designated to the call-recipient to the call-originator terminal at the sound server by performing a call set-up with the sound server using routing information on routing to the sound server.

It is characterized in that the sub-step of sending the ring-back tone designated to the call-recipient to the

call-originator terminal, comprises the sub-substeps of:
selecting pre-registered ring-back tone identification
information from a subscriber database in correspondence to
a call-recipient telephone number; extracting a particular
5 ring-back tone information for sending to the call-
originator terminal from a sound database using the ring-
back tone identification information selected from the
subscriber database; and regenerating the ring-back tone
information extracted from the sound database into a sound
10 and sending regenerated sound to the call-originator
terminal through the outgoing-side MSC.

Brief Description of the Drawings

The above and other objects, features and advantages
15 of the present invention will be more apparent from the
following detailed description taken in conjunction with
the accompanying drawings, in which:

FIG. 1 shows a schematic construction of a mobile
communication network provided with a ring-back tone
20 service according to the present invention;

FIG. 2 shows an internal construction of the sound
server of FIG. 1;

FIG. 3 shows a processing procedure of a No. 7 signal
message for explaining an operation of a system for
25 providing a ring-back tone service system according to the
present invention; and

FIG. 4 is an operational flow chart for explaining a
method for providing a ring-back tone service according to
the present invention.

30

Best Mode for Carrying Out the Invention

Hereinafter, a preferred embodiment of the present
invention will be described with reference to the

accompanying drawings.

In the present invention, a variety of ring-back tones designated by either a call-recipient or call-originator are transmitted to a call-originator terminal by
5 cooperating an existing switching center and other communication network equipment, using a sound server for storing and managing the variety of ring-back tones, such as melodies, advertisements, effect sounds, words of greeting and so on, which are transmitted to a call-
10 originator terminal. A schematic construction of a mobile communication network in which this ring-back tone service is provided is shown in accompanying FIG. 1.

To be specific, as shown in FIG. 1, a system for providing a ring-back tone service according to present
15 invention is based on a construction of a mobile communication network, in which the mobile communication network includes Mobile Switching Centers (MSCs) 10a and 10b including a Visitor Location Register (VLR), a Home Location Register (HLR) 15 storing information of
20 subscribers with a separate computer, at least one Base-station Transceiver Subsystem (BTS) processing wireless connection, a Base Station Controller (BSC) interposed between the MSCs 10a and 10b and the BTS and performing control and management of the BTS, and at least one Mobile
25 Station (MS) or mobile subscriber. These components are cooperated with each other. Here, to implement the present invention, a sound server 20 is designed to cooperate with the MSCs 10a and 10b and the HLR 15 through the communication network. In FIG. 1, each component of the
30 mobile communication network is shown divided into an incoming side and an outgoing side in connection with processing of incoming/outgoing calls for convenience' sake of description.

Here, with a more detailed description of communication network equipment for implementing the ring-back tone service according to present invention, the HLR 15 does not only function as one of components of an existing communication network, but also provide a function for managing information on whether or not subscribed to the ring-back tone service and whether active or inactive state of the ring-back tone service, and information for routing to the sound server 20 in order to provide the ring-back tone service by setting these information to profile information.

The incoming/outgoing-side MSCs 10 and 10b do not only function as one of components of an existing communication network, but also perform a call set-up function for a sending request of a designated ring-back tone to the sound server 20 and for sending the ring-back tone in cooperation with the HLR 15. In addition, the MSCs 10 and 10b provide a function for receiving a particular ring-back tone, which is designated according to the subscriber, from the corresponding sound server 20 and then for sending the received ring-back tone to a call-originator terminal side.

Further, the sound server 20 stores and manages information on various ring-back tones designated according to the subscriber so as to provide the ring-back tone service, and performs a function for sending a particular ring-back tone corresponding to a request of the incoming-side MSC 10b. As shown in FIG. 2 as one of the accompanying drawings, this sound server 20 includes a subscriber database interworking process unit 21, a sound database interworking process unit 22, a sound processing unit 23, a network interworking unit 24, a service processing unit 25, and an external interworking process unit 26. In this case, the subscriber database interworking process unit 21

stores and manages desired information on a subscriber database, in which the desired information are subscriber information (or a call-recipient telephone number) which is necessary to determine the ring-back tone for sending to the call-originator terminal, caller ID information (a name, a telephone number etc.) corresponding to the subscriber information, and ring-back tone identification information designated according to a call-originator group, a call-originator age group, gender, calling time and so on. The sound database interworking process unit 22 stores and manages ring-back tone information designated according to each subscriber on a sound database together with the ring-back tone identification information, in which the ring-back tone information are, for example, melodies, advertisements, effect sounds, words of greeting and so on. The sound processing unit 23 extracts a particular ring-back tone managed by the sound database interworking process unit 22 based on the subscriber information managed by the subscriber database interworking process unit 21, and then regenerates the extracted ring-back tone into a sound, and finally transmits the regenerated sound. The network interworking unit 24 cooperates with the outgoing/incoming MSCs 10a and 10b through the communication network based on No. 7 protocol, and then sends the particular ring-back tone regenerated into the sound by the sound processing unit 23 to the outgoing-side MSC 10a. The service processing unit 25 processes operation of a server related to a series of ring-back tone services for sending a particular ring-back tone, which is designated to a call-recipient, to a call-originator side through the outgoing MSC 10a by controlling the sound processing unit 23 and the network interworking unit 24. The external interworking process unit 26

provides a cooperation function for interworking with external equipment, and stores and manages the ring-back tone information toward the subscriber database interworking process unit 21 and the sound database interworking process unit 22.

Here, the external interworking process unit 26 includes a web cooperator 26-1 for providing a function for producing and managing the ring-back tone information through a contents provider on the basis of Internet, a terminal cooperator 26-2 for providing functions for managing the ring-back tone services and for storing and managing particular ring-back tone information through a terminal on the basis of Internet, and an ARS cooperator 26-3 for providing functions for managing the ring-back tone services and for storing and managing particular ring-back tone information through an automatic response system.

Hereinafter, a detailed description will be made regarding operation for performing ring-back tone services in the ring-back tone service system constructed as mentioned above in accordance with the present invention in reference to FIGs. 3 and 4.

First, to receive the foregoing ring-back tone service, a user must be subscribed to a ring-back tone service served by a mobile communication carrier. Additionally, the service must be activated. The HLR makes management of information on whether or not subscribed to this ring-back tone service and whether or not the service is activated.

Further, to send a ring-back tone designated to a call-recipient to a call-originator terminal as in the present invention, at least one of a call-recipient telephone number and information on a particular ring-back tone corresponding to the telephone number, for example

melodies, advertisements, effect sounds, words of greeting and so on, must be not only registered to the sound server 20, but also allowed to be managed. To this end, ring-back tone identification information is stored and managed on
5 the subscriber database of the subscriber database interworking process unit 21, in which the ring-back tone identification information determines ring-back tones for sending to call-originator terminals through the web
10 cooperator 26-1 or the terminal cooperator 26-2 or the ARS cooperator 26-3 according to a call-recipient telephone number, caller ID information (a name, a telephone number, etc.) corresponding to the call-recipient telephone number, a call-originator group, a call-originator age group, gender, calling time and so on. At the same time,
15 information on various ring-back tones designated according to each subscriber is stored and managed the sound database of the sound database interworking process unit 22 together with the ring-back tone identification information.

In this manner, when information on the particular
20 ring-back tone for sending to the call-originator terminal is registered to the sound server 20 by the subscriber subscribed to the ring-back tone service (Step S41), the ring-back tone service is served to the subscriber according to operational procedures described below.

25 That is, as arbitrary call-originator dials the telephone number of desired call-recipient to attempt a call, it is checked whether or not an outgoing call is generated from the call-originator (Step S42). If the outgoing call is generated, the outgoing-side MSC 10a
30 requests information on location of the call-recipient from the HLR 15 by transmitting a location request message to the HLR 15.

At this time, the HLR 15 receiving the location request message searches subscriber information of the corresponding call-recipient to check whether or not the call-recipient is subscribed to the ring-back tone service
5 and whether or not the ring-back tone service is activated (Step S43). If the call-recipient is not subscribed to the ring-back tone service or if the ring-back tone service is not activated, a typical ring-back tone is sent to the call-originator terminal (Step S44). Further, according to
10 a typical call process procedure, a call is established with the incoming-side MSC 10b (Step S45).

However, if the call-recipient has been subscribed to the ring-back tone service and if the ring-back tone service has been activated, a routing request message is
15 transmitted to the incoming-side MSC 10b in order to provide the ring-back tone service according to the present invention. Here, as a response to the routing request, the incoming-side MSC 10b transmits incoming information (Temporary Local Directory Number (TLDN)) for a call set-up
20 to the HLR 15 using a routing response message.

Thus, the HLR 15 receiving the routing response message transmits the incoming information receiving from the corresponding incoming-side MSC 10b in response to the location request of the outgoing-side MSC 10a. In this
25 case, the incoming information is transmitted to the outgoing-side MSC 10a using the location response message, and at the same time information on routing to the sound server 20 is included in the corresponding location response message (Step S46).

30 Then, the outgoing-side MSC 10a transmits a call request message to the incoming-side MSC 10b, wherein the call request message includes the incoming information and information on routing to the sound server 20 in order to

perform the call set-up with the incoming-side MSC 10b. As a response to this, the incoming-side MSC 10b receiving the corresponding call request message transmits a call connect message to the outgoing-side MSC 10a, so that there is
5 generated one call between the outgoing-side MSC 10a and the incoming-side MSC 10a.

Further, the incoming-side MSC 10b does not only perform a series of speech set-up operations for calling the recipient's terminal through the BSC and the BTS using
10 the incoming information included in the call request message (Step S47), but also perform the call set-up with the sound server 20 using the routing information included in the call request message in order to provide a series ring-back tone services for sending a designated ring-back
15 tone to the call-originator side.

In other words, the incoming-side MSC 10b does not only perform a series of speech set-up operation for calling the cal-receiver terminal, but also transmit the call request message to the sound server 20 to perform the
20 call set-up with the sound server 20. As a response to this, the sound server 20 receiving the corresponding call request message transmits the call connect message to the incoming-side MSC 10b, and subsequently transmits a call response message indicating its own incoming response to
25 the incoming-side MSC 10b, and finally sends the designated ring-back tone to the call-originator terminal through the outgoing-side MSC 10a (Step S48).

To this end, the sound processing unit 23 of the sound server 20 makes choice of pre-registered ring-back tone
30 identification information from the subscriber database interworking process unit 21 in correspondence to the call-recipient telephone number under the control of the service processing unit 25. In this case, the choice is made of

the ring-back tone identification information determined according to caller ID information corresponding to the call-recipient telephone number, a call-originator group, a call-originator age group, gender, calling time and so on.

5 With use of the ring-back tone identification information selected so, there is extracted information on determined ring-back tones for sending from the sound database interworking process unit 22 to the call-originator terminal side, in other words, information on
10 determined ring-back tones, such as melodies designated to the call-recipient, advertisements, effect sounds, words of greeting and so on. Then, the corresponding ring-back tone information is regenerated into a sound to be transmitted to the outgoing-side MSC 10a through the network
15 interworking unit 24, so that the ring-back tone designated to the call-recipient is sent to the call-originator terminal.

Here, operation of sending the ring-back tone designated to the call-recipient to the call-originator
20 terminal at the sound server 20 continues to be performed until the corresponding call-recipient responds to the calling (Steps S49 and S50). If the call-recipient responds to the calling, the incoming-side MSC 10b transmits a call rejection message to the sound server 20
25 to stop sending the designated ring-back tone to the call-originator terminal (Step S51). In this case, when the sound server 20 receives the call rejection message from the incoming-side MSC 10b, the sound server 20 stops the operation of sending the designated ring-back tone to the
30 call-originator terminal, and transmits a call disconnect message to the incoming-side MSC 10b as a response to the call rejection.

The incoming-side MSC 10b transmits a call response message indicating an incoming response to the call-originator 10a, so that a speech path is formed between the call-originator terminal and the recipient's terminal. As
5 a result, it is possible to perform a speech (Step S52)

Industrial Applicability

AS can seen from the foregoing, according to the present invention, the call-originator can be provided with
10 various ring-back tones, such as melodies, advertisements, effect sounds, words of greeting and so on, which are registered by subscribers instead of hearing an undifferentiated ring-back tone when calling the call-recipient.

15 Further, the present invention provide the call-originators with designated ring-back tones which are registered by subscribers, so that the call-originator can not only discriminate whether or not connected correctly before a response of the call-recipient, but also receive
20 various ring-back tones suitable for a characteristic of the call-recipient.

Although a preferred embodiment of the present invention has been described for illustrative purposes, those skilled in the art will appreciate that various
25 modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as disclosed in the accompanying claims.

Claims

1. A system for providing a ring-back tone service to a call-originator terminal in a communication network, the system comprising:

5 incoming/outgoing-side mobile switching centers (MSCs) for performing a call set-up function for a sending request of a ring-back tone and for sending the ring-back tone, receiving the corresponding ring-back tone, and sending the received ring-back tone to the call-originator terminal
10 side;

a sound server for storing and managing information on various ring-back tones designated by subscribers of the ring-back tone service, and performing a function for sending a designated ring-back tone corresponding to the
15 sending request of the incoming-side MSC; and

a home location register (HLR) for setting and managing two kinds of information to profile information, one of the two kinds of information being information on whether or not subscribed to the ring-back tone service and
20 on an active/inactive state of the ring-back tone service, the other being information on routing to the sound server.

2. A system as claimed in claim 1, wherein the sound server comprises:

25 a subscriber database interworking process unit for storing and managing ring-back tone identification information on the ring-back tone for sending to the call-originator terminal on a subscriber database together with subscriber information;

30 a sound database interworking process unit for storing and managing ring-back tone information designated according to each subscriber on a sound database together with the ring-back tone identification information;

a sound processing unit for extracting a designated ring-back tone managed by the sound database interworking process unit based on the subscriber information managed by the subscriber database interworking process unit,
5 regenerating the extracted ring-back tone into a sound, and transmitting the regenerated sound;

a network interworking unit for sending the designated ring-back tone regenerated into the sound by the sound processing unit to the outgoing-side MSC in cooperation
10 with the outgoing/incoming MSCs; and

a service processing unit for processing operation of the server related to a series of ring-back tone services for sending the ring-back tone designated to a call-recipient to the call-originator side through the outgoing
15 MSC 10a by controlling the sound processing unit and the network interworking unit.

3. A system as claimed in claim 2, wherein the subscriber database stores a call-recipient telephone
20 number, caller ID information corresponding to the call-recipient telephone number, and the ring-back tone identification information designated to the subscriber information divided according to a call-originator group, a call-originator age group, gender, calling time.

25

4. A system as claimed in claim 2, wherein the ring-back tone information is the designated ring-back tone information selected from melodies, advertisements, effect sounds, words of greeting, each of which has the ring-back
30 tone identification information.

5. A system as claimed in claim 2, wherein the sound server further comprises an external interworking process

unit for providing a cooperation function for interworking ;
with external equipment, and storing and managing the ring-
back tone information toward the subscriber database
interworking process unit and the sound database
5 interworking process unit..

6. A system as claimed in claim 5, wherein the
external interworking process unit comprises:

a web cooperator for providing a function for
10 producing and managing the ring-back tone information
through a contents provider on the basis of Internet;

a terminal cooperator for providing functions for
managing the ring-back tone services and for storing and
managing particular ring-back tone information through a
15 terminal on the basis of Internet; and

an ARS (Automatic Response Service) cooperator for
providing functions for managing the ring-back tone
services and for storing and managing particular ring-back
tone information through an automatic response system.
20

7. A method for providing a ring-back tone service to
a call-originator terminal in a communication network, the
method comprising the steps of:

a) registering and managing information on a particular
25 ring-back tone for sending to the call-originator terminal
by subscribers of the ring-back tone service to a sound
server;

b) checking whether or not the ring-back tone service
is activated by searching subscriber information on a call-
30 recipient at a home location register (HLR) when an
outgoing call is generated from arbitrary call-originator;

c) when the ring-back tone service of the call-
recipient is activated, requesting routing to an incoming-

side mobile switching center (MSC) to generate a call between the corresponding outgoing-side and incoming-side MSCs; and

d) sending the ring-back tone designated to the call-recipient to the call-originator terminal side by performing a call set-up with the sound server at the incoming-side MSC.

8. A method as claimed in claim 7, wherein the step a) stores and manages ring-back tone identification information designated to the subscriber information based on a call-recipient telephone number on a subscriber database, and stores and manages information on various ring-back tones designated according to each subscriber on a sound database together with ring-back tone identification information.

9. A method as claimed in claim 8, wherein the ring-back tone information is one corresponding to the call-recipient telephone number, caller ID information corresponding to the call-recipient telephone number, and the ring-back tone identification information designated to the subscriber information divided according to a call-originator group, a call-originator age group, gender, calling time.

10. A method as claimed in claim 8 or 9, wherein the ring-back tone information is the designated ring-back tone information selected from melodies, advertisements, effect sounds, words of greeting, each of which has the ring-back tone identification information.

11. A method as claimed in claim 7, wherein the step
c) comprises the sub-steps of:

requesting routing to the incoming-side MSC at the HLR
according to a location information request of the
5 outgoing-side MSC to receive incoming information;

transmitting the received incoming information to the
outgoing-side MSC together with routing information on
routing to the sound server; and

transmitting a call request message including the
10 incoming information and the routing information to the
incoming-side MSC at the outgoing-side MSC to generate the
call between the incoming-side and outgoing-side MSCs.

12. A method as claimed in claim 7, wherein the step
15 d) comprises the sub-steps of:

performing operation for a speech set-up with the
recipient's terminal using incoming information receiving
from the outgoing-side MSC at the incoming-side MSC; and

20 sending the ring-back tone designated to the call-
recipient to the call-originator terminal at the sound
server by performing a call set-up with the sound server
using routing information on routing to the sound server.

13. A method as claimed in claim 7, wherein the sub-
25 step of sending the ring-back tone designated to the call-
recipient to the call-originator terminal, comprises the
sub-substeps of:

selecting pre-registered ring-back tone identification
information from a subscriber database in correspondence to
30 a call-recipient telephone number;

extracting a particular ring-back tone information for
sending to the call-originator terminal from a sound

database using the ring-back tone identification
information selected from the subscriber database; and
regenerating the ring-back tone information extracted
from the sound database into a sound and sending
5 regenerated sound to the call-originator terminal through
the outgoing-side MSC.

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Fig. 1

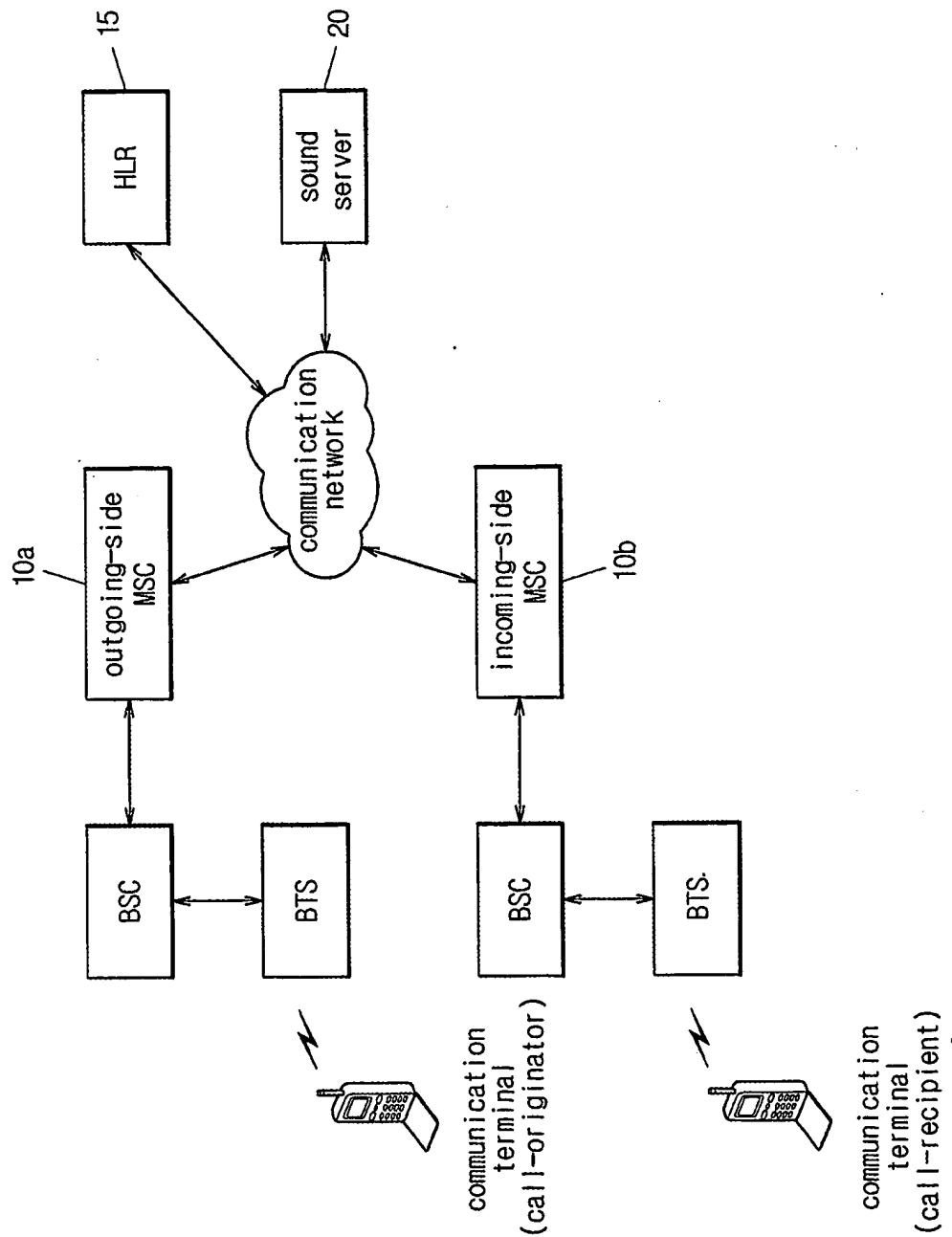
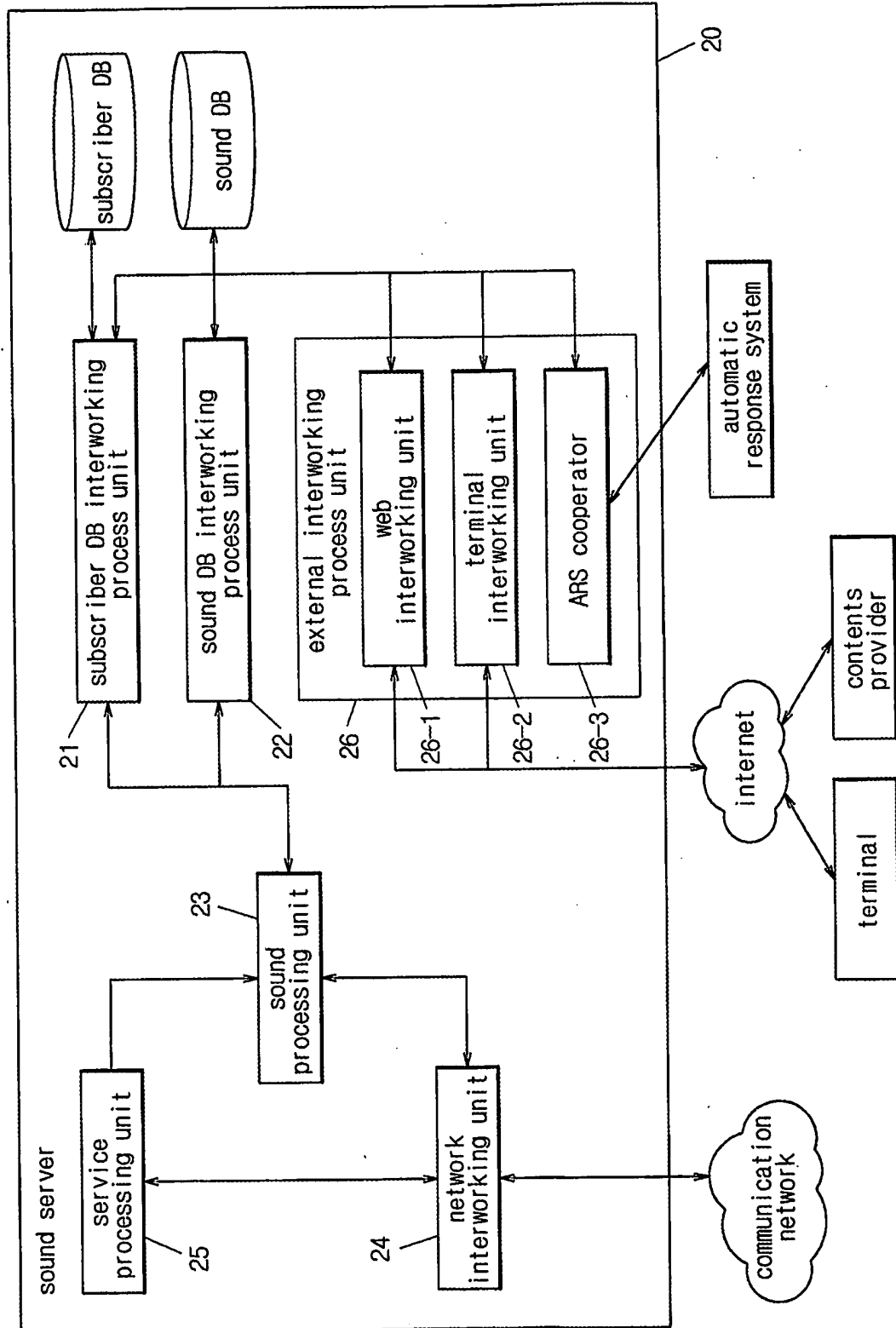
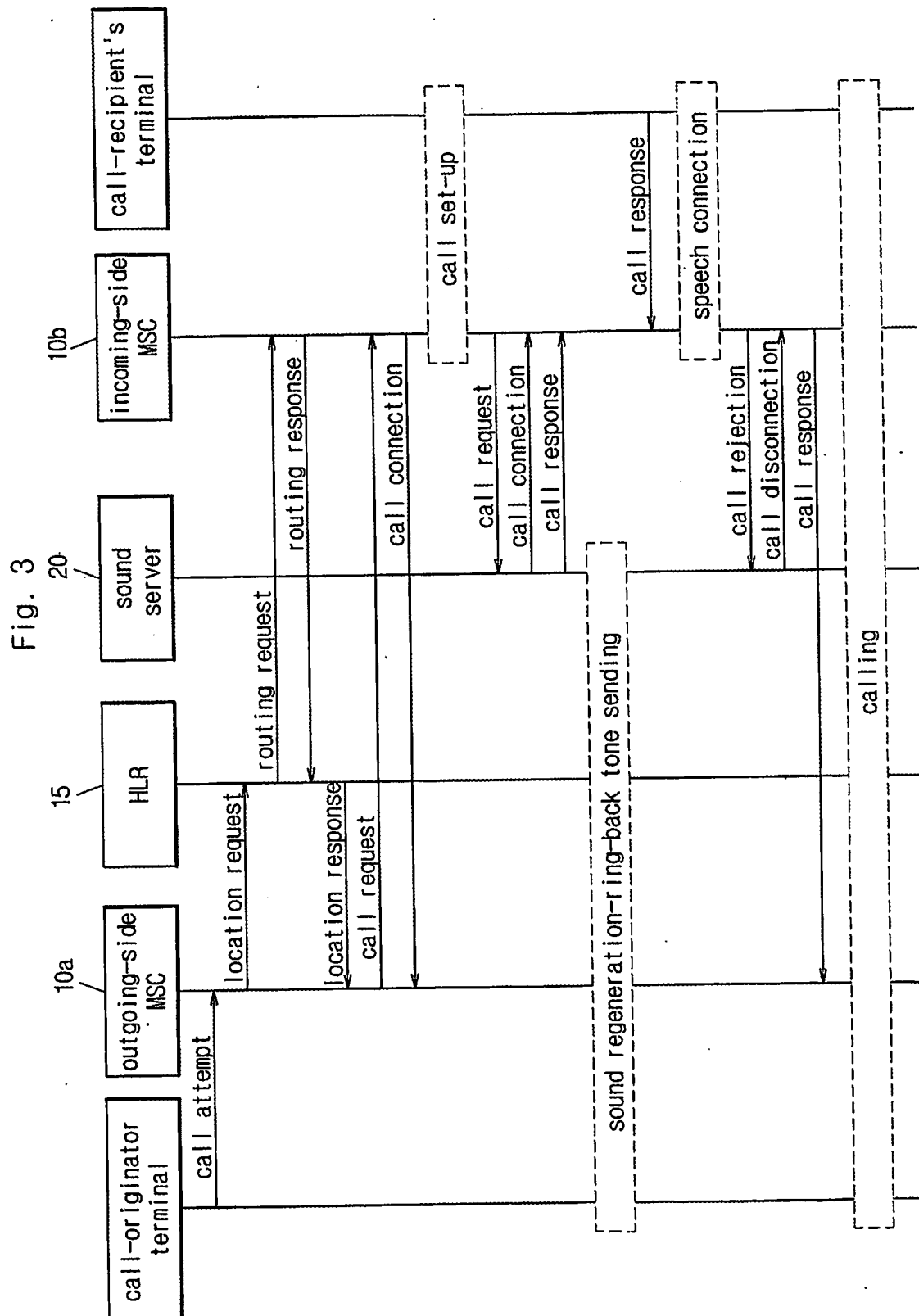
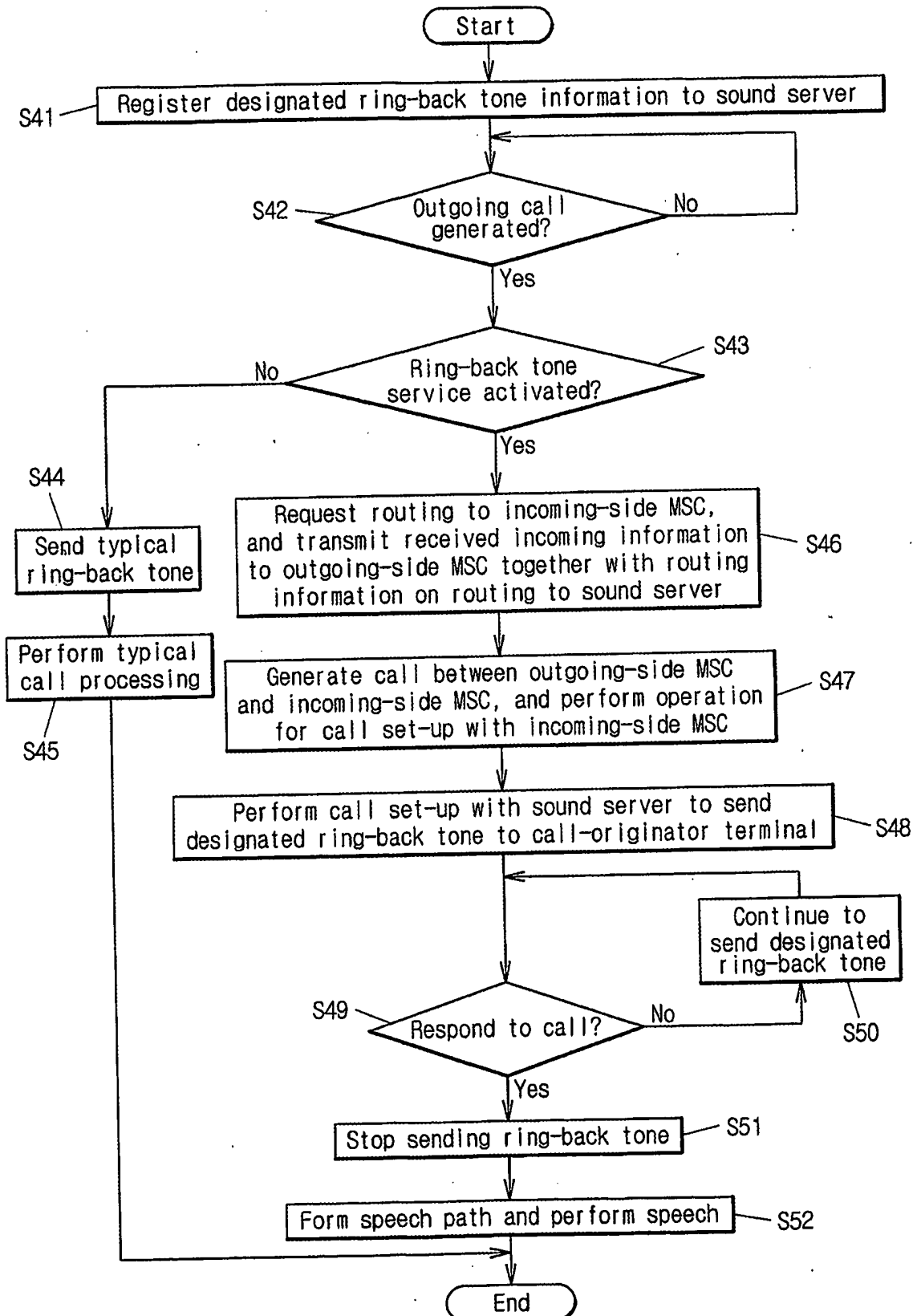


Fig. 2



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Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR 03/01296-0

CLASSIFICATION OF SUBJECT MATTER		
IPC ⁷ : H04M 3/487, H04Q7/38		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC ⁷ : H04M, H04Q		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
WPI, EPODOC, PAJ		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/071815 A1 (SK TELECOM CO., LTD.) 28 August 2003 (28.08.03) <i>abstract, figs. 1, 3, 5; page 1, line 27 - page 3, line 1; page 3, line 26 - page 6, line 20; page 8, line 11 - page 9, line 10; page 9, line 26 - page 11, line 18.</i>	1-13
&	KR 20020056833 (SK TELECOM CO., LTD.) 10 July 2002 (10.7.02)	
Y	WO 98/36585 A2 (NORTHERN TELECOM INC.) 20 August 1998 (20.08.98) <i>abstract, figs. 1-4; page 3, line 31 - page 5, line 21; page 6, lines 1-16; page 8, line 20 - page 10, line 12.</i>	1-13
Y	WO 01/05133 A2 (ADTEL LIMITED) 18 January 2001 (18.01.01) <i>abstract, figs. 1,2,4,9; page 3, line 35 - page 6, line 22; page 7, line 33 - page 8, line 19; page 11, lines 6-12; page 12, lines 12-23.</i>	1-13
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: „A“ document defining the general state of the art which is not considered to be of particular relevance „E“ earlier application or patent but published on or after the international filing date „L“ document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) „O“ document referring to an oral disclosure, use, exhibition or other means „P“ document published prior to the international filing date but later than the priority date claimed „T“ later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention „X“ document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone „Y“ document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art „&“ document member of the same patent family		
Date of the actual completion of the international search		Date of mailing of the international search report
10 November 2003 (10.11.2003)		26 November 2003 (26.11.2003)
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR 03/01296-0

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 01/06735 A2 (RHEE, H.C. et al.) 25 January 2001 (25.01.01) <i>abstract, figs. 1-3, 9a, 9b; page 10, line 23 - page 12, line 20; page 21, line 13 - page 26, line 6.</i> -----	1-13

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR 03/01296-0

Patent document cited in search report			Publication date		Patent family member(s)	Publication date	
WO	A	5133			none		
WO	A	6735			none		
WO	A	71815			none		
WO	A	9836585	1998-08-20	CA	A	2280371	2001-02-16
				US	B	6181927	2001-01-30
				EP	A	0962090	1999-12-08